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(12) United States Patent
Fujita et al.**(10) Patent No.: US 6,342,335 B1**
(45) Date of Patent: Jan. 29, 2002**(54) POLYMETHINE COMPOUNDS, METHOD OF PRODUCING SAME, AND USE THEREOF****(75) Inventors:** Shigeo Fujita, Osaka; Nobuaki Sasaki; Keiki Chichilishi, both of Kyoto; Yasuhisa Iwasaki, Nara, all of (JP)**(73) Assignee:** Yamamoto Chemicals, Inc., Osaka (JP)**(*) Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.**(21) Appl. No.:** 09/598,044**(22) Filed:** Jun. 20, 2000**(30) Foreign Application Priority Data**

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(51) Int. Cl.⁷ G03F 7/00**(52) U.S. Cl.** 430/270.1; 430/302; 430/944; 430/945; 101/463.1; 101/453; 548/469**(58) Field of Search** 430/270.1, 302, 430/944, 945, 270.11, 270.21; 101/453, 463.1; 548/469**(56) References Cited****U.S. PATENT DOCUMENTS**4,973,572 A * 11/1990 DeBoer 503/227
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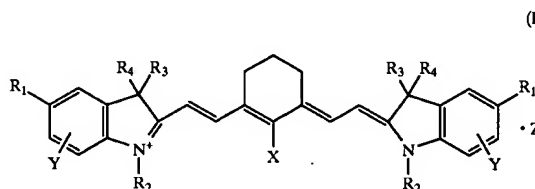
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Synthesis of New Near-Infrared Fluorescent Labels." J. Org. Chem. 60 (1995): 2391-2395.*

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The invention provides near infrared absorbing materials showing high light-to-heat conversion efficiency and high sensitivity to lasers whose emission bands are within the range of 750 nm to 900 nm, original plates for direct printing plate making, and novel compounds which can be applied to such absorbing materials and plates. The compounds are polymethine compounds of the general formula (I) A detailed description of general formula (I) may be found in the specification.



wherein R₁ represents an alkoxy group which may be substituted; R₂ represents an alkyl group which may be substituted; R₃ and R₄ each represents a lower alkyl group or R₃ and R₄ taken together represent a ring; X represents a hydrogen atom, a halogen atom or a substituted amino group; Y represents an alkoxy group which may be substituted or an alkyl group which may be substituted; Z represents a charge neutralizing ion.

15 Claims, 15 Drawing Sheets